

CLAIMS

1. A surface acoustic wave sensor for detecting the minute mass applied to a surface acoustic wave element on the basis of the change in frequency using an SH-type surface acoustic wave, the surface acoustic wave sensor comprising:

a rotated Y-cut LiTaO_3 substrate having Euler angles (0° , 0° to 18° , $0^\circ \pm 5^\circ$) or (0° , 58° to 180° , $0^\circ \pm 5^\circ$);

electrodes, principally containing Au, for exciting a surface acoustic wave, the electrodes being arranged on the LiTaO_3 substrate; and

a reaction membrane, bound to a target substance or a binding substance bound to the target substance, covering the electrodes arranged on the LiTaO_3 substrate,

wherein the electrodes have a normalized thickness of 0.8% to 9.5%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave.

2. The surface acoustic wave sensor according to Claim 1, wherein the rotated Y-cut LiTaO_3 substrate has Euler angles (0° , 120° to 140° , $0^\circ \pm 5^\circ$).

3. The surface acoustic wave sensor according to Claim 1 or 2, further comprising a bonding layer,

placed between the reaction membrane and the electrodes, for enhancing the bond between the reaction membrane and the electrodes.

4. The surface acoustic wave sensor according to Claim 1, further comprising a protective layer, placed between the reaction membrane and the electrodes, lying over the electrodes and regions outside the electrodes.

5. The surface acoustic wave sensor according to Claim 3, further comprising a protective layer, placed between the bonding layer and the electrodes, lying over the electrodes and regions outside the electrodes.

6. The surface acoustic wave sensor according to any one of Claims 1 to 5, wherein the electrodes have a normalized thickness of 1.2% to 8.5%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave.

7. The surface acoustic wave sensor according to Claim 6, wherein the electrodes have a normalized thickness of 1.9% to 6.6%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave.

8. The surface acoustic wave sensor according to Claim 7, wherein the electrodes have a normalized

thickness of 3.0% to 5.0%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave.

9. A biosensor comprising the surface acoustic wave sensor according to any one of Claims 1 to 8, wherein the reaction membrane contains a substance bound to a biological substance that is a target substance and the mass applied to a face of the substrate of the surface acoustic wave sensor is varied due to the bind of the biological substance to the reaction membrane.